

organisms within a few decades,” says Carol Turley of the Plymouth Marine Laboratory.

Jean-Pierre Gattuso of CNRS-University Pierre and Marie Curie, who has researchers in the team said: “The oceans absorb about a quarter of human-made carbon dioxide. This has been limiting the amount of greenhouse gas in the atmosphere and mitigating climate change. However, the massive amounts absorbed — about 24 million tons every day — considerably upset the ocean chemistry by increasing the acidity of seawater.”

Pen Hadow, the director of the survey, who also led last year’s expedition, said the Arctic Ocean’s vulnerability motivated the trip. “We know that disappearing ice cover and the potential impacts of acidity are parts of some big ocean changes. Since ocean acidification is widely viewed as a bellwether for wider global change, it is important we understand better what is happening.”

The ice base on the western shore of Ellef Rignes Island in Canada will be home to a team of six scientists who will work on the ice, protected by two guides to ward off polar bears attracted by the human activity.

The Catlin Group, international speciality insurers, sponsors the survey to allow scientists to obtain data that can be used to forecast the risk posed by the changing environment.

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Hadow says: “Our aim at the Catlin Arctic Survey is to make it possible for science work to be undertaken that would otherwise be exceptionally difficult to do. The scientists will be able to work safely thanks to the skills of our polar support team who will be guiding them out onto the floating sea ice. Our Ice Base will have all the facilities they need to conduct analyses and to survive in the extreme conditions of the Arctic winter and spring.”

Whaling battles

Australia is on collision course with Japan over its whaling. **Michael Gross** reports.

Dramatic scenes unfolded this January in the Southern Ocean, as campaigners tried to stop Japanese whalers from their annual slaughter of up to 1,000 whales “for scientific purposes”. On January 6, the *Ady Gil*, a boat of the Sea Shepherd Conservation Society, sank after a collision with a whaling ship. Its captain was taken prisoner by the crew of the Japanese vessel and taken to Japan. Undeterred by these events, the campaigners have continued to fight the whalers with two other vessels, including the *Bob Barker*, which was also rammed by a whaler in February, and the *Steve Irwin*. On February 25, after three full weeks in which the whalers were unable to kill a single animal, Captain Paul Watson called off the campaign due to engine problems. “Both ships have done an awesome job this year. We’ve hurt the Japanese whaling fleet more this year than any year before,” Watson said.

Australians back these actions with a vast majority. In a recent television appearance on the *Sunrise* show, Prime Minister Kevin Rudd was confronted with an angry caller demanding an end to the “illegal slaughter of our whales”. His critics are losing patience, as putting an end to whaling in the Southern Ocean was one of Rudd’s election promises when he was voted in three years ago. However, in his twitter feed (@kevinruddpm) he prefers to enthuse about Australian successes at the Winter Olympics and doesn’t mention whaling at all.

On February 19, Rudd formally set an ultimatum: if Japan doesn’t call off the whaling in the Southern Ocean by November, that is, before the beginning of the next whaling season, Australia will take the country to the International Court of Justice. Environmentalists, while supporting the move on principle, have argued that this is Rudd’s first serious attempt to make good his election promise, and that it might have something to do with the next election approaching. On the other hand, Japan is one of Australia’s most important trade partners and an

ally in many other fields, so Rudd’s government was obviously reluctant to upset the Japanese by starting an open conflict. When he was grilled on the *Sunrise* show, Rudd emphasized that there have been negotiations with the three different governments that Japan has had since his election, and that he sees the legal challenge as a last resort.

The moratorium has saved several species, including the Pacific Grey Whale, from extinction, but has been under continuous attack from pro-whaling countries led by Japan.

In response to the threat, Japan’s Foreign Minister Katsuya Okada insisted that his country’s activities were legal under the provision of ‘scientific permits’ in accordance with the rules of the International Whaling Commission (IWC). The IWC is due to hold its annual meeting at Agadir, Morocco, in June, where the debate is certain to come up on the agenda. As a compromise solution, an IWC working group has suggested to replace the ban with fixed quota for commercial whaling, in exchange for closing the loophole of scientific whaling.

Commercial whaling has been banned under the so-called moratorium for nearly 25 years. Exceptions from the ban include countries that haven’t agreed to the moratorium (Norway), scientific whaling (used by Japan although conservationists argue that it hasn’t produced scientific results and the meat has been sold commercially), and ‘traditional’ subsistence whaling by indigenous people like the Inuits of Alaska. The moratorium has saved several species, including the Pacific Grey Whale, from extinction, but has been under continuous attack from pro-whaling countries led by Japan (*Curr. Biol.* 15, R478).

William Megill, an engineer and zoologist who has studied Pacific Grey Whales thinks that, while the whaling activities of Norway and Iceland in the northern hemisphere are well-regulated, the Japanese



Angered: Australia is seeking legal means to halt Japan's annual whaling in the Southern Ocean. (Photo: Davison/Greenpeace.)

whaling in the Southern Ocean is problematic. "The Japanese are still out catching fairly significant numbers of whales, and not just minke, though that's what they're meant to be focusing on," he commented. "If they stuck to their targets, and did their whaling as they say they do when they're at the IWC meetings, then I think they might have a little more support. They'd also need to do the research nobody is doing and actually go count how many minke there are, so that real, informed quotas could be set."

Meanwhile, a research group led by Andrew Pershing at the University of Maine has estimated that a century of whaling has released more than 100 million tonnes of carbon into the atmosphere. In the early days, much of the whale fat was converted to carbon dioxide directly, as it was used as lamp oil. But even today, whaling

diminishes what Pershing describes as "the forests of the oceans".

Whales can serve as a very efficient means of natural carbon capture and storage. "This marine system is unique because when whales die [naturally], their bodies sink, so they take that carbon down to the bottom of the ocean," Pershing said. "If they die where it's deep enough, it will be [stored] out of the atmosphere perhaps for hundreds of years."

Pershing also suggested that carbon credits and financial schemes that are already applied in rainforest conservation could help to protect whale populations. Maybe the right kind of incentive could even wean the Japanese off their whale-hunting habit.

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New climate change scenarios

Climate change could impact both wealthy and poorer nations. **Nigel Williams** reports.

While controversy still surrounds some of the workings of the International Panel on Climate Change, others are continuing to consider the consequences of rising atmospheric carbon dioxide levels. While many believe poorer, low-lying countries may bear the brunt of climate change, a group of researchers, planners and economists have been considering possible consequences for a wealthy country — the UK.

They considered three scenarios of climate change, all of which suggest major upheaval to the pattern of life in the country. Mass migration northwards to new towns in Scotland, Wales and north-east England may be needed to cope with climate change and water shortages in south-east England, according to a vision set out by the UK Government Office for Science.

Failure to manage land in a co-ordinated way could result in severe shortages of resources and 'public goods', such as water, wildlife and urban green space.

Heathrow airport could be converted to a reservoir by 2035, there could be severe restrictions on flying and driving and farmers may be forced to sell their land to giant agricultural businesses. Greenhouse gas emissions would be controlled by carbon rationing for individuals which would lead to 'significant shifts in lifestyle as everyone stays within budget'.

The vision was published last month in a report — Land Use Futures: Making the Most of Land in the Twenty First Century. John Beddington, the government's chief scientific adviser, who directed the research, said that climate change and the growing population would present Britain with difficult choices about how it used its land.